

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

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Applicant's or agent's file reference
758.1416WOU1

IMPORTANT NOTIFICATION

International application No.
PCT/US 03/1867

International filing date (day/month/year)
07.10.2003

Priority date (day/month/year)
08.10.2002

Applicant
DONALDSON COMPANY, INC. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 758.1416WOU1	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA416)	
International application No. PCT/US 03/31867	International filing date (day/month/year) 07.10.2003	Priority date (day/month/year) 08.10.2002
International Patent Classification (IPC) or both national classification and IPC B01D29/15		
Applicant DONALDSON COMPANY, INC. et al.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

- This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 05.05.2004	Date of completion of this report 15.02.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Hoffmann, A Telephone No. +49 89 2399-8610 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/1867

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-19 as originally filed

Claims, Numbers

1-18 received on 13.01.2005 with letter of 13.01.2005

Drawings, Sheets

1/16-16/16 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/31867**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-14 (for the case that claim 1 is more clear), 15 -18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/31867

The following documents are cited in the Int. Search Report and during examination:

D1: US-A-5 490 930
D2: WO 95/09037 A
D3: GB-A-2 356 825
D4: US-A-2 902 162
D5: WO 97/37743 A
D6: US-A-4 853 118
D7: DE 11 52 285 B
D8 : US-A-3397789
D9: US-A-3232437

POINT V:

1. In principle it is known in the art, see D1-D9, to provide spacing means in the region of the end cap(s) of a filter element, to space the filter element from the housing wall.

The spacing means touch free against the wall of a housing having an open end and a closed end, as for instance in D4, figure 1 and 2 ("50"), D6, figure 1, or D5, figure 5, or they engage against a side of a ledge provided in the housing wall directed to the open end of the housing, such that when the filter element is inserted in the housing the projections further more stop further insertion of the filter element as for instance in D8, figure 1 or D9, figure 1, often further more clamped between the housing and a base plate or housing parts.

2. The core of the present invention is the method of claim 15, thus the provision of an inwardly extending ledge being circumferential and extending completely along an internal surface of a housing having an open end and a closed end and the provision of a projection arrangement on the filter element to be inserted, both being dimensioned such that the projection arrangement has to slide over the said ledge during insertion of the filter element into the housing to be engaged afterwards against the side of the ledge directed to the closed end of the housing.

None of the documents cited give a hint for such a solution which has the advantages of the projection means of the prior art and at the same time the advantage that the inserted filter element automatically is kept in a firm hold within the housing.

Thus the subject matter of claim 15 fulfils the requirements of Articles 33(2) and (3) PCT.

3. The subject matter of claim 1 is directed to a filter assembly with a special housing form. The closest prior art for such a filter element is D7, figure 1.

The wording tries to define the invention of claim 15 as explained in paragraph 2) above for such a special filter assembly.

The definition can only define the invention of claim 15 for the special case that the ledge being located directly adjacent the threaded region of the housing, thus for the case that the projection arrangement has to pass the ledge during insertion of the filter element as shown in figures 5-7 and 19 of the present description. But for the case that the ledge is provided anywhere between the threaded region and the closed end of the housing the present wording of claim 1 does not exclude that the projection means engage against the side of the ledge directed to the open end of the housing. Thus the subject matter of claim 1 is not sufficiently clear in this regard (Article 6 PCT). For the case that claim 1 is more clearly directed to the invention of claim 15, the subject matter fulfils the requirements of Article 33 (2) and (3) PCT.

4. The dependent claims are supported by the independent claims.

What is claimed is:

1. A fluid filter arrangement (20, 140, 300, 300') comprising:
 - (a) a housing (22, 166, 304, 304') having a wall (28", 172, 308) defining a closed end (30, 174, 310), an open end (32, 176), an interior volume (44), and an inwardly extending ledge (126, 180, 318, 318');
 - (i) the housing including a threaded region (86, 178, 316, 316') adjacent to the open end;
 - (ii) the inwardly extending ledge (126, 180, 318, 318') being circumferential and extending completely along an internal surface of the housing wall;
 - (A) the inwardly extending ledge (126, 180, 318, 318') being located between the closed end and the threaded region (86, 178, 316, 316');
 - (b) a filter cartridge (24, 168, 306, 306') oriented within said interior volume of said housing; said filter cartridge including a tubular construction of filter media defining an open filter interior;
 - (i) said tubular construction of filter media (46, 190, 328) having a first end;
 - (ii) said filter cartridge includes an end cap (54, 192, 324, 324') secured to said first end of said tubular construction of filter media; said end cap defining an aperture in fluid communication with said open filter interior;
 - (c) a projection arrangement (100, 210, 350, 400) constructed and arranged to space said filter cartridge from said housing wall to define a fluid flowpath between said filter cartridge and said housing wall;
 - (i) the projection arrangement includes a base (96, 212, 354, 404) and a sidewall (98, 214, 356, 406);
 - (ii) said projection arrangement comprising at least one projection (110, 220, 362, 410) in extension from at least one of said base and said sidewall;
 - (iii) the projection arrangement engaging the inwardly extending ledge (126, 180, 318, 318') to space said filter cartridge from

said housing wall to define a fluid flowpath between said filter cartridge and said housing wall.

2. A fluid filter arrangement according to claim 1 wherein:
 - (a) said projection arrangement includes a plurality of projections.
3. A fluid filter arrangement according to claim 2 wherein:
 - (a) each of said projections (110, 362, 410) extends axially to engage said housing.
4. A fluid filter arrangement according to any one of claims 2 and 3 wherein:
 - (b) said base (404) and said sidewall (406) are part of a plate (402) that is a separate piece from said end cap (324').
5. A fluid filter arrangement according to any one of claims 2 and 3 wherein:
 - (a) said base (96, 212, 354) and said sidewall (98, 214, 356) are part of said end cap (54, 192, 324).
6. A fluid filter arrangement according to claim 4 wherein:
 - (a) each of said projections (110, 362, 410) extends axially from said sidewall (98, 356, 406) of said endcap (54, 324, 324').
7. A fluid filter arrangement according to claim 6 wherein:
 - (a) said sidewall includes a media-containing portion (99, 360) that forms a continuous wall (98, 356) around said filter media;
 - (i) said media-containing portion (99, 360) extending from said base (96, 354) and having an end (114, 368);
 - (A) each of said projections (110, 362) being in extension from said end of said media-containing portion.
8. A fluid filter arrangement according to anyone of claims 2-7 wherein:
 - (a) each of said projections (110, 220, 362, 410) includes a free end;
 - (i) each free end of said projections engaging the inwardly extending ledge (126, 180, 318, 318').

9. A fluid filter arrangement according to claim 2 wherein:
- (a) each of said projections (221, 222, 223) extends radially to engage the inwardly extending ledge (180).
10. A fluid filter arrangement according to claim 9 wherein:
- (a) each of said projections (221, 222, 223) extends radially from said base (212) of said endcap (192).
11. A fluid filter arrangement according to claim 10 wherein:
- (a) said sidewall (214) includes a media-containing portion (216) that forms a continuous wall (218) around said filter media;
 - (i) said media-containing portion extending from said base (212); and
 - (ii) said projections (221, 222, 223) being generally orthogonal relative to said media-containing portion.
12. A fluid filter arrangement according to any one of claims 1-8 wherein:
- (a) a portion (323) of the housing wall adjacent to the filter media defines an internal diameter about equal to an internal diameter of the housing wall between the threaded section and the internally extending ledge (318, 318');
 - (i) between the internally extending ledge (318, 318') and the portion (323) is a region of the housing wall having an internal diameter greater than the internal diameter of the portion to form a relief (380);
 - (A) the relief (380) allowing the projection arrangement (350, 400) to spring back to a normal position.
13. A fluid filter arrangement according to any one of claims 2-12 wherein:
- (a) said filter media includes pleated media and a second end opposite of said first end;
 - (b) said end cap is a first end cap; and
 - (c) said filter cartridge further includes:

- (i) a second end cap secured to said second end of said filter media;
 - (A) said second end cap being closed; and
 - (ii) an inner tubular liner circumscribed by said pleated media;
 - (A) said inner tubular liner extending between said first end cap and said second end cap.
- 14. A filter assembly comprising a fluid filter arrangement according to any one of claims 1-13; the filter assembly comprising:
 - (a) a filter head having a fluid flow inlet port and fluid flow outlet port; and
 - (b) the filter arrangement is releasably secured to said filter head.
- 15. A method of making a filter; the method comprising:
 - (a) inserting a filter cartridge (24, 168, 306, 306') and a projection arrangement into an open end of a housing; and
 - (b) engaging projections on the projection arrangement (100, 210, 350, 400) against a portion of the housing to secure the filter cartridge in the housing;
 - (i) the portion of the housing including an inwardly extending circumferential ledge (126, 180, 318, 318') extending completely along an internal surface of the housing; and
 - (ii) the engagement of the projection arrangement is against a side of the ledge directed to a closed end of the housing.
- 16. A method according to claim 15 wherein:
 - (a) the filter cartridge (24, 168, 306) includes an end cap (54, 192, 324) having the projections extending therefrom; and
 - (b) said step of engaging includes engaging the projections (110, 220, 362) from the end cap against the inwardly extending ledge (126, 180, 318) of the housing.
- 17. A method according to claim 15 wherein:

- (a) said step of inserting includes inserting a filter cartridge (306') and then inserting a separate plate (402) into the open end of the housing;
 - (i) the separate plate (402) including the projecting arrangement (400).

18. A method according to any one of claims 15-17 wherein:

- (a) said step of inserting includes snapping the projections over a radial protrusion in the housing; and
- (b) said step of engaging includes engaging the projections against the radial protrusion.